Home work #7	Ch 6: 6.3-6.4 Ch 7: 7.1	Fri, 02/04/05

Ch. 6

Q17:

It is possible for a system may to have a potential energy due to gravity $PE = mgh$.

Q22:

a) Potential energy due to gravity $PE = mgh$ because h is increased.

b) At the lowest point because all potential energy $PE = mgh$ is transformed into kinetic energy $PE = \frac{1}{2} mv^2$.

c) Potential energy $PE = mgh$ is greater at the highest point where h is greater.

Q29:

Yes. The total energy (potential energy $PE = mgh$ plus energy due to push KE $= \frac{1}{2} mv^2$) of the sled may allow it to cross a hump of the hill even higher than the first hump.

E12:

a) $KE = \frac{1}{2} mv^2 = \frac{1}{2}$ (0.2 kg) (5 m/s)$^2 = \frac{1}{2}$ (0.2 kg) (25 m^2/s^2) = 2.5 J

b) $KE = PE = 2.5$ J, because $PE = mgh$, $h = PE/mg$ = (2.5 J)/(0.2 kg) (10 m/s^2) =

= (2.5 J)/(2 kg·m/s^2) = 1.25 m

E14:

a) $PE = mgh = (50\ kg)(10\ m/s^2)(15\ m) = 7500$ (or J)

b) Total $PE = (7500\ J) + (1600\ J) = 9100\ J$

c) $KE = 9100\ J$

Ch. 7

Q3:

Yes. The momentum is $p = mv$, so if a baseball will have larger velocity, its momentum can be larger as a much more massive bowling ball.

E5:

$Impulse = F\Delta t = \Delta p = m\Delta v = p_f - p_i = 0 - mv = 0 - (0.12\ kg)\ (40\ m/s) =$ $- 4.8\ kg{\cdot}m/s$

E6:

a) Impulse = change in momentum = 9 kg·m/s

b) $Impulse = F\Delta t$, hence $F = impulse/\Delta t = (9\ kg{\cdot}m/s)/(0.15\ s) = 60\ kg{\cdot}m/s^2$ or N

CP4a:

a) $\Delta p = p_f - p_i = 0 - mv = 0 - (90\ kg)\ (18\ m/s) = -1620\ kg{\cdot}m/s$

b) The impulse is equal to the change of momentum. Hence, it is require the impulse of -1620 kg·m/s